Development and characterization of novel herbal formulation of *Ageratum conyzoides Linn* extract

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By

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INTRODUCTION:

Ageratum conyzoides L., an annual plant, has an ancient legacy of use as a conventional healer around the globe, particularly in tropical and semitropical areas. It is also a widespread weed species in India. Alkaloids, flavonoids, chromenes, benzofurans, and terpenoids, among many other chemical substances, have all been identified from this species. It has been discovered that this plant's extracts and metabolites have pharmacological and insecticidal properties.

- Domain : Eukaryota
- Kingdom : Plantae
- Phylum : Spermatophyta
- Subphylum : Angiospermae
- Class : Dicotyledonae
- Subclass : Asteridae
- Order : Asterales
- Family : Asteraceae
- Genus : *Ageratum*
- Species : *conyzoides*

A. *conyzoides* is a tropical, annual herb that is straight, hairy, slender, branching, and odoriferous. It grows to a height of about 1 m. It has poorly fixed, roots with a yellowish brown colour that are profound, bud, and fibrous. In young plants, the stem is aerial, cylindric, weak, and green; over time, it becomes sturdy and slightly brown. Simple, opposite, stalked, oval leaves measure 5 to 50 mm in width and 20 to 100 mm in length. They feature pronounced veins, a sharply pointed shortened base, and sharp edges. Sturdy peduncles (50-150 mm long; 5 mm broad) that are supported by 4–18 flower heads (60–70 distinct blooms) of varied sizes and coloured white, violet, or greyish blue are encircled with 2–3 rectangular, greenish petals. It is possible to see the concave-convex curve on the straight petiole.

Many pharmacological effects, including anti-inflammatory, antipyretic, and analgesic properties, have been linked to A. conyzoides essential oil (Abena et al., 1996). Because to their analgesic and anti-inflammatory qualities, the leaves and flowers are used as an infusion.Literature studies show its effectiveness in reducing pain brought on by people osteoarthritis (Marques et al., 1988) or pain brought on by an artificially produced condition (Magalhaes et al., 1997). (Viana et al., 1998, Yamamoto et al., 1991) revealed for its anti-inflammatory properties is debatable. Pyrrolizidine alkaloid illustrated exact chemical composition which are toxic to the liver, according to Mendonca et al. (1995).Costa; 1977,

isolated flavonoids, tannins, saponins, coumarins and other substances by using phytochemical screening. However, (Okunade; 2002) illustrated the toxicological characteristic of this plantand handful research that revealed *Ageratum conyzoides*, hepatotoxicity. In current research, we assessed the preclinical study for toxicity of a raw extract of aerial parts of *Ageratum conyzoides* when used chronically in male rats.

OBJECTIVE:

In addition to being often used in Nigeria for skin issues and tissue regeneration, an infusion of the plant is also given orally to treat diarrhoea and to alleviate child navel discomfort (Okunade, 1981).It is employed as an oil lotion for purulent opthalmia and for the treatment of leprosy in India (Kirtikar and Basu, 1991).Brazilian folk medicine uses A. conyzoides medicinal teas as anti-inflammatory, analgesic, and anti-diarrheal agents (Correa, 1984; Cruz, 1985; Okunade, 2002). The tribal people of Western Cameroon's Bangangte region frequently utilise its juice to treat peptic ulcers (Noumi and Dibakto, 2000).The current research work illustratedthe **development and characterisation of an innovative herbal formulation of Ageratum conyzoides Linn extract** after realising the potential utility of this herbal plant was used in treatment of many diseases.

There are some main benefits regarding this work will be as follows:-

- Reduced Dosage frequency
- Improve Bioavailability of the drug
- First pass metabolism of drug is avoided
- Decrease the dose to be administered
- Reduce frequency of dosing
- Decrease side or unwanted effect
- Easy to discontinue in case of toxic effect
- Maintain constant blood levels for longer period of time

The main objectives of the research work are given as-

- To identify the herbal plant and authenticate from authentic person/ institutions.
- To prepare of various extracts of the selected plants by using different solvents.
- To study the mechanism of action of the active extract/s.
- To perform pre-formulation studies of the selected herbal drug extract and polymers.
- To development and characterization of novel herbal formulation of selected herbal drug extract
- To perform the various characterization parameters of the optimized novel herbal formulation of selected herbal drug extract.
- To perform the evaluation of prepared novel herbal formulation of selected herbal drug extract

Literature Review:

Detailed review and research literature study related to the topics which shows different work done by the researchers. Important inferences found from the following literatures summarized as follows:

Chah et al, 2006has investigated methanolic extracts of Ageratum conyzoides, anthocleista djalonensis, Napoleona imperialis, Ocimum gratissimum, and Psidium guajava have been used in treatment of the antibacterial and reduced inflammation capabilities of.Using the well diffusion method, the extracts' antibacterial activities were investigated against four types of Staphylococcus aureus, two strains of E. coli, one strain each of Aeruginosa, three strains of Proteus spp., & Shigella spp., and eleven lesion isolates. The excision wound model was used to

assess the ability of Ageratum conyzoides, Anthocleista djalonensis, Napoleonaea imperialis, and Ocimum gratissimum to cure lesions.

Mendonca et al, 2005 revealed that oils from the following plants had high activity levels, having corresponding LC50 values of 14.5, 41, 57, 98, and 148 Ag/l: Anacardium occidentalis, Copaifera langsdorffii, Carapa guianensis, and *Ageratum conyzoides*.The Annona glabra stem extract, with an LC50 value of 27 Ag/l, was the most potent ethanolic extract that was examined. It can be recommended that cashew nut oil, a waste product from industry with no marketable application, be used to kill the vector of dengue and yellow fever.

ITA et al, 2007explored any possible haematological effects that can be brought about by giving rats an ethanolic leaf extract of *Ageratum conyzoides.* In current research, the haematopoietic properties of Ageratum conyzoides were assessed.A normal blood evaluation in the body can be confirmed by determining haematological indices. Ageratum conyzoides leaf extract in ethanol was gavaged to rats in this study, and the results showed a considerable increase in Hb (haemoglobin) concentration, red blood cell counts. White blood cells and packed cell volume were also estimated.

Tan et al, 2010has studied Ageratum conyzoides L.'s anticancer and radical-scavenging properties (Asteraceae). They used the sulphorhodamine B (SRB) assay to test the in vitro studies of *A. conyzoides* extracts contained butanol, petroleum ether, ethanol, ethyl acetate and aqueous extracts of in several cancer cell lines. These cell lines include the mouse leukaemia (P-388) and the human quasi cell lung carcinoma (A-549) as well as the human the human gastric carcinoma (SGC-7901), colorectal adenocarcinoma (HT-29), the human golima (U-251), the human breast carcinoma (MDA-MB-231) the human hepatic carcinoma (BEL-7402), the human prostate carcinoma (DU-145) and the human gastric carcinoma. By nuclear magnetic resonance (NMR) for kaempferol structure determination and mass spectroscopy after it was separated

from the ethyl acetate extract. It was also examined how the extracts and kaempferol were affected by DPPH antiradical activity. According to the findings, ethyl acetate extract had the augmented cytotoxicity against the cancer cells (A-549 and P-388), with IC50 values of 0.68 and 0.0003 g/ml, corresponding. At a concentration of 130.07±17.36 g/kg, kaempferol, which was extracted from the ethyl acetate extract of *A. conyzoides*, quickly repurposed DPPH. According to the findings, A. conyzoides had anticancer and antiradical capabilities.

Ojezele et al, 2012 has evaluated into the compositions of the minerals, proxies, phytochemicals, and hypoglycaemic effects of Commelina africana and Ageratum conyzoides extracts in diabetic rats, as well as the potential connections between these properties and the plant's compositions of minerals, proxies, and phytochemicals.

Hossain et al, 2013A. Conyzoides leaves were extracted using ethanol, and several chemical analyses revealed the presence of tannins, saponins, alkaloids, gums, reducing sugars, steroids and a substantial amount of flavonoids.

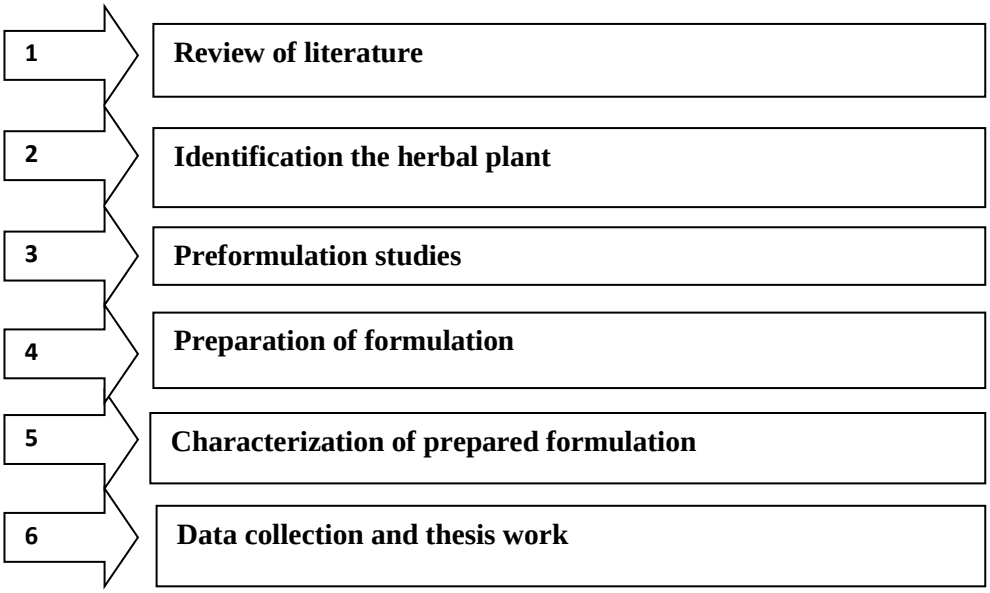
Biavatti et al 2016 has studied the plant's standardised poly methoxy flavone extract (SEPAc) to determine its antinociceptive and anti-inflammatory properties. By eliminating the toxicity of the pyrrolizidine alkaloids, they created a standardised extract of polymethoxyflavones from A. conyzoides and added to the body of knowledge regarding their antinociceptive and anti-inflammatory properties.

Sachin et al 2009evaluated the topical healing of lesions potential of a polyherbal preparation including the roots of *A. conyzoides* Linn, as well as a comparative investigation of the effects of herbal formulations comprising *Ageratum conyzoides, Curcuma longa, Tamarindus indica & Ficus religiosaand. Ageratum conyzoides* has ability to heal wounds, which is thought to be a result of the appearance of its active chemical constituents, which speed up the recovery process & give the healed wound breaking strength.

Kamboj et al, 2011has investigated the phytochemical composition of Ageratum conyzoides (Asteraceae) aerial portions and discovered the existence of alkaloids, steroids, saponins, terpenes, fatty acids and phenolic compounds. They recognise and describe the plant's aerial sections' bioactive component. Folk medicine uses it extensively.The bioactive component of the plant's aerial parts is recognised and described. It is heavily employed in folk medicine. Ageratum conyzoides' dried aerial parts powder was heated to a petroleum ether extraction temperature in order to isolate the component. After being submitted to chromatography and being saponified with alcoholic KOH, this extract, it was concentrated. Chloroform was used to clean the isolated component. The isolated and purified white crystalline powder was subjected to physical, chemical, and spectral identification using IR, 1H-NMR, 13C-NMR, and GC-M.S. Sitosterol and stigmasterol were identified as the chemical.

Fröde et al, 2016examined the anti-inflammatory activities of the phytochemicals from the aerial portions of *A. conyzoides L.*, including eupalestin, 1,2-benzopyroneas, 5'-methoxy nobiletin well as the crude extract and its derived fractions, including ethanol, hexane, and ethyl acetate.

Plan of Work



Activities	Duration in Months																				
	0	1	2	3	4	5	6	7	8	9	10	11	12-19	20	21	22	23	24	25	26-32	
Procurement of Materials																					
Preformulation Studies																					
Optimization of Formula																					
Formulation Development																					
Characterization of Formulation																					
First Research paper Submission																					
Stability Studies																					
In-Vivo Studies, Data Interpretation & Compilation																					
Second Research paper Submission																					
Thesis Writing and Submission																					

Conclusion

The proposed research will be revealing a development of new drug delivery system which provides a sustained and targeted delivery of ***Ageratum conyzoides Linn*** **extract**. The new drug delivery provides various advantages like reduced the dosage frequency, easy to administer the dosage form with improved efficacy and minimum side effects, more patient compliance.

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